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SHORELINES – October 2009

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Is it Shell Collecting or Fossil Collecting?

One of everyone's favorite beach pastimes is shell collecting, especially at the first light of the morning or when the sun is setting. While many of the shells we find on North Carolina's beaches such as whelks, moon snails, olive shells, and cockles are the remnants of recently deceased mollusks and gastropods; perhaps even more of the shells we find can actually be considered as fossils – thousands or even millions of years old.

This "shell or fossil" question came to surface (no pun intended) in our local Jacksonville Daily News and Tideland Newspapers when individuals recently discovered huge oyster shells on the beaches of Topsail Island and Onslow Beach. At first there was some consideration that these were the biggest oysters in the modern world, but actually they are almost certainly the fossil oyster *Crassostrea gigantissima* - *Crassostrea virginica* is their smaller, thin-shelled counterpart relative that we eat today.

These huge fossil oyster shells are prolific in the *Oligocene Epoch Belgrade Formation* (named for its archetype in Belgrade), which also lies just underneath the Onslow Beach/North Topsail area. *C. gigantissima* are exposed several feet deep in the New River Inlet area and are exposed offshore - big storms bring the fossils to the beach. You may also recognize the Belgrade formation as that tan or grayish sandstone that occasionally washes up along the beaches of western Emerald Isle. Relative to the geologic age of these giant fossil oysters, the Oligocene was generally from 34 to 23 million years ago and *C. gigantissima* also lived in this rough timeframe and probably into the Miocene (a bit younger) and first appeared in the Eocene (a little older than the Oligicene). And finally, paleontologist have hypothesized that *C. gigantissima* needed a bigger shell to survive in response to growing in a full marine environment and were more susceptible to predation and bio-erosion. Accordingly, *C. gigantissima* had thicker shells and exhibited faster growth rates that any oyster of today.

That's obviously information overload, but here is a quick list of more evidence that demonstrates more often than not; we're fossil collecting.

Oysters (mostly *C. virginica*) – Unlike *C. gigantissima*, the modern oyster makes its home in the estuary – it is ***not*** a marine mollusk. However, black-stained oysters are the dominant shell found on many of North Carolina's beaches. They eroded from old estuarine mud (hundreds to thousands of years old) that the barrier islands have migrated over and now are part of the shell assembly you see on the beach.

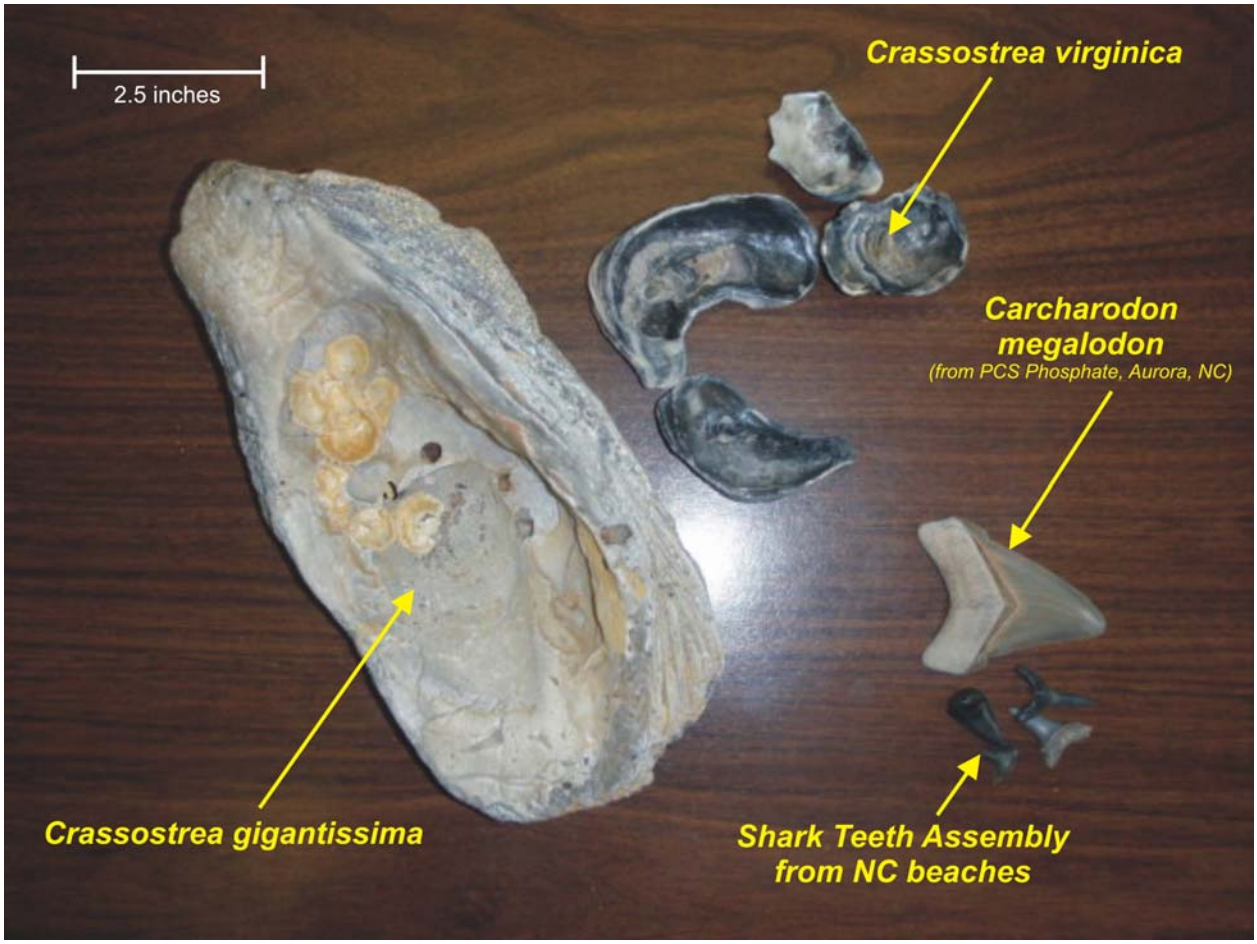
Angelwings (*Cyrtopluera costata*) – Somewhat akin to oysters, Angelwings thrive in high brackish environments usually near inlets, and in many areas are now part of the shoreface as islands transgress landward.

Orange Shell Gravel (*Mercenaria* and other bivalve mollusks) – Many of the orange shell gravel observed on the beaches have been exposed to air for a significant amount of time

and have been oxidized. These shells then have been flooded again by seawater, and wash up along our beaches today. The likely age of these fossils are probably several 10,000 years old or a 100,000 plus years old.

Shark Teeth – Last but not least. These are everyone's favorite and the most prized possession for the Carolina shell/fossil collector is the *Carcharodon megalodon*, a great white shark that went extinct roughly 1.5 million years ago and were big as a school bus. Tiger and Mako teeth are also popular. More often than not, the teeth we find are not the teeth themselves but consist of phosphate and other marine minerals that have seeped into the small pores of the teeth – the actual tooth material dissolves and the phosphate is left behind. Sharks have been around for a long time and thanks to the geology of the North Carolina coast, *in general*, the further south one goes in the State, the older the shark teeth. Some geologic formations offshore have more preserved teeth than others.

Happy fossil collecting!



Some examples of the fossils that are often seen along the beaches of North Carolina, quite often millions of years old.